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Emission Inventory Requirements for 1982 Ozone State Implementation Plans

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Final Emission Inventory Requirements for 1982 Ozone State Implementation Plans

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16. ABSTRACT

This guidance document describes the final emission inventory requirements related to preparation and submission of 1982 Ozone State Implementation Plans (SIP's) for those States which requested and have been granted an extension beyond July 1982 of an attainment date for the National Ambient Air Quality Standard (NAAQS) for ozone.

Addressed in the document are emission inventory requirements relating to geographic area of coverage, point source cutoff size specifications, pollutants of interest, data reporting formats, documentation requirements, quality of data base, years to be addressed, and specific inventory techniques to be employed.

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by

Monitoring and Data Analysis Division

and

Control Programs Development Division

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air, Noise, and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711
December 1980

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PREFACE

This guidance document describes the final emission inventory requirements related to preparation and submission of 1982 Ozone State Implementation Plans (SIP's) for those States which requested and have been granted an extension beyond July 1982 for an attainment date for the National Ambient Air Quality Standard (NAAQS) for ozone. Comments received on the September 1980 draft version of this document are reflected in the final requirements. All comments are gratefully acknowledged.

The major changes incorporated in this document are summarized briefly below:

1. Emissions shall represent a typical summer weekday rather than a seasonally adjusted annual rate. As such, emissions shall be reported in units of kilograms per (24 hour) day. As a minimum, plants or facilities whose reactive volatile organic compound (RVOC) or NO_x emissions exceed 250 kg/day (equivalent to 100 tons per year) shall be inventoried as point sources. For consistency, it is recommended that all seasonally adjusted activity levels and ambient parameters used to calculate emissions represent daily (24 hour) averages during the June-August time period. Moreover, activity levels should represent weekday rather than weekend day averages for this time period. Reasonable deviations from this definition of a typical summer weekday are acceptable if agreed to by the Regional Office.

2. County-by-county emission summaries need not be included in the ozone SIP inventory submittals. Emission totals need only be submitted which summarize (1) the entire nonattainment area and (2) any modeling analysis areas

within the nonattainment area. (Note: emissions should still be compiled at the county or equivalent level.)

3. Summary formats equivalent to that shown in Table 1 are acceptable if approved by the Regional Office and if the alternative formats still allow EPA to directly evaluate and compare the projected emission reductions resulting from the various RACT measures on a source category by source category basis.

4. The individual point source listing of major RVOC point sources need not be in the exact format suggested in Table 2 of the draft document. Any (including computer produced) listings containing equivalent information are acceptable if the formats are reasonably similar. This point source listing is only required for the base year and only for > 250 kg/day sources, a cutoff roughly equivalent to 100 tons per year.

5. No inventory summaries need be submitted for the intermediate years between the base year and the attainment year. This information, required to demonstrate reasonable further progress (RFP), should be submitted as part of the SIP's rather than as part of the emission inventory submittals.

6. Either MOBILE1 or MOBILE2 may be used to compile highway vehicle emissions; however, use of MOBILE2 is encouraged as the resulting emission estimates will be more accurate.

EMISSION INVENTORY REQUIREMENTS FOR 1982 OZONE STATE IMPLEMENTATION PLANS (SIP's)

SUMMARY

For 1982 ozone SIP's, current, comprehensive and accurate emission inventories of stationary and mobile sources which emit reactive volatile organic compounds (RVOC) and oxides of nitrogen (NO_x) are required for each ozone nonattainment area that has requested an extension to attain the ozone standard. The inventory shall be reported for a typical summer weekday during the ozone season. Assumptions representative of the ozone season (i.e., generally summertime) shall be used to compute seasonally adjusted totals of reactive VOC and NO_x emissions. Emissions shall be summarized and reported for the entire nonattainment area as well as for those portions of each nonattainment area for which ozone modeling analyses will be performed. The base year inventory shall be representative of calendar year 1980, if possible. Projection year inventories are also required for the attainment year (generally 1987).

As a minimum, all stationary sources (facilities) that emit 250 kilograms/day or more (actual emissions) of either reactive VOC or NO_x emissions shall be individually inventoried as point sources. Each point within the facility shall be inventoried and emissions reported. (Identical, small points within these facilities may be grouped and reported collectively as a single point.) Smaller point source cutoffs (i.e., less than 250 kg/day) are acceptable and strongly encouraged especially for those RVOC sources in categories covered by EPA's Control Technique Guideline Documents (CTG's)[1,2] and for those which States are defining reasonably available control technology (RACT). Emission estimates shall be determined to the extent possible using locally derived information in

conjunction with methodologies described in Procedures for the Preparation of Emission Inventories for Volatile Organic Compounds - Volume I (Second Edition, September 1980).[3] Alternate procedures may be used provided they are agreed to by the appropriate EPA Regional Office. A quality assurance program shall be implemented by the States to assure that the emission data are current, comprehensive and accurate.

The highway vehicle emission inventory must be developed as part of the transportation-air quality planning process defined in the June 1978 EPA-DOT Transportation-Air Quality Planning Guidelines.[4] The same data base used in the emission inventory must also be used to evaluate the effectiveness of transportation control measures. Development of the highway vehicle emission inventory must be coordinated with development of the stationary source inventory. The geographic areas must be compatible and the base and projection years must be consistent. Responsibilities for development of highway vehicle emission inventories should be identified in the Section 174 agreement between State and local agencies. The State transportation agency, the lead planning agency, the Metropolitan Planning Organization (MPO), and the State Air Pollution Control Agency shall be involved. Either MOBILE1[5] or MOBILE2[6] may be used to compile highway vehicle emissions.

The base year and projected base line attainment year inventories of stationary and mobile sources shall be compiled, documented and submitted to the appropriate EPA Regional Office by December 31, 1981. The 1982 "SIP Strategy" inventories shall be completed and submitted along with the SIP's by July 31, 1982. Earlier inventory submittals are encouraged. Emissions shall be summarized in a specified emission summary report format. A listing of each major reactive VOC point

source shall also be provided for the base year identifying the source, the emissions and the type of process operation. Documentation shall also be prepared and submitted to EPA that summarizes the specific assumptions, data and procedures used in preparing the base year and projection inventories. All documentation shall be submitted at the same time as the inventory data.

I. INTRODUCTION

The Clean Air Act provides that areas failing to attain the National Ambient Air Quality Standards for ozone by December 1982 may, under certain conditions, be granted an extension to December 1987 to attain the standard. A condition of this extension requires that revisions to the applicable State Implementation Plan (SIP) be made and submitted to the Administrator by July 1, 1982.

The Act also prescribes that current, comprehensive and accurate emissions data shall be submitted to EPA for each nonattainment area. Further, these emission data are to be updated periodically to demonstrate reasonable further progress (RFP) toward attainment of the standard by the attainment date. This guideline prescribes EPA's policies regarding the emission data base to be collected and submitted to EPA with respect to the approval of the SIP revision due by July 1, 1982. It will be the policy of the Administrator to view compliance with these emission inventory data base criteria as an important element of the 1982 ozone SIP submittal.

For purposes of compliance with those portions of the Act relating to the submission of emission data bases, the following criteria shall apply:

Comprehensive: As a minimum, all sources (plants or facilities) that emit 250 kg/day or more (actual emissions) of oxides of nitrogen (NO_x) and/or reactive volatile organic compounds (RVOC) shall be inventoried as point sources. All other sources shall be inventoried either as point sources or collectively as area sources. All reasonable efforts shall be made to assure that all point and area emission sources are identified and emissions reported.

Accurate: A quality assurance program shall be implemented to assure that the inventory is complete and accurate. For example, States shall complete and document efforts to assure that all point sources within the nonattainment areas are included and shall assure that emissions are correctly reported for each of these sources. Documentation summarizing the assumptions, data and procedures used in compiling and assuring the quality of the inventory shall be prepared and submitted to EPA concomitant with the inventory submittals.

Current: The base year emission inventory shall be representative of 1980, if possible.

II. SPECIFIC EMISSION INVENTORY REQUIREMENTS

States shall prepare countywide base year and projection emission inventories representative of a typical summer weekday. The inventories shall include emissions of reactive volatile organic compounds (RVOC) and oxides of nitrogen (NO_x) from stationary and mobile sources. Guidance for compiling reactive VOC emission inventories for non-highway vehicle sources is contained within Procedures for the Preparation of Emission Inventories for Volatile Organic Compounds - Volume I (Second Edition, September 1980).[3] Volume I procedures may also be used to inventory sources of NO_x.

With respect to highway vehicles, EPA is currently reviewing transportation data in 19 cities designated as Level I or II for ozone.[7] As a result of the review, EPA will make recommendations to each of the 19 urban areas concerning feasible actions to improve the quality of transportation data. EPA is also preparing a document that identifies key transportation and emission parameters (such as VMT per person and RVOC emissions per VMT) and identifies reasonable ranges of values for these parameters.[8] This document will be used by EPA, States and local agencies to identify data that appear to be unreasonable and which should be subject to further review. Preliminary recommendations on improvements to existing transportation data bases were provided by EPA to the 19 Level I and Level II areas in December of 1980.

More specifically, States shall be guided by the following requirements:

1. Area to be Inventoried

The entire ozone nonattainment area that has requested an extension to attain the ozone standard shall be inventoried. Emission estimates shall be

compiled and maintained on a countywide basis, except (1) in those areas where information is commonly available at the city, township, parish or other equivalent or smaller political jurisdiction, or (2) where only a fraction of a county is contained in the nonattainment area. In such cases, emission estimates may be compiled and maintained on a non-county basis.

2. Base Year Emission Inventory

The base year of the inventory shall be representative of actual 1980 emission levels, if possible. As such, the inventory shall consider the realized impact of implemented SIP regulations on base year emission levels. The base year inventory is to be submitted to EPA in summary format (see Table 1).

3. Emission Inventories Projected to the Attainment Year

Inventories of typical summer weekday emissions shall be developed for the year the ozone standard is projected to be attained. In most cases, this will likely be 1987. Two attainment year projection inventories are required. These include (a) the projected base line attainment year inventory and (b) the projected "1982 SIP strategy" attainment year inventory.

(a) The projected base line attainment year inventory shall consider (1) the increases (or decreases) in emissions due to growth (since the base year), (2) the decreases in emissions due to the realized impact of already adopted SIP regulations, and (3) any other anticipated changes in emissions from the base year to the attainment year (except those changes due to additional regulations proposed in the 1982 ozone SIP's). Such changes should reflect increases or decreases in emissions due to unique, irregularly occurring events or conditions which affected the base year inventory. For example, temporary

TABLE 1-a

Summary Table of Reactive VOC Emissions*
for (geographical area)

	Base Year		Baseline Projection		SIP Strategy	
	1980		Attainment year		Attainment year	
	Point	Area	Point	Area	Point	Area
STORAGE, TRANSPORTATION AND MARKETING OF VOC						
Oil and Gas Production & Processing						
Gasoline and Crude Oil Storage[1]						
Synthetic Organic Chemical Storage & Transfer						
Ship and Barge Transfer of VOC						
Barge and Tanker Cleaning						
Bulk Gasoline Terminals[2]						
Gasoline Bulk Plants[3]						
Service Station Loading (Stage I)						
Service Station Unloading (Stage II)						
Others (Specify)						
INDUSTRIAL PROCESSES						
Petroleum Refineries						
Lube Oil Manufacture						
Organic Chemical Manufacture						
Inorganic Chemical Manufacture						
Fermentation Processes						
Vegetable Oil Processing						
Pharmaceutical Manufacture						
Plastic Products Manufacture						
Rubber Tire Manufacture						
SBR Rubber Manufacture						
Textile Polymers & Resin Manufacture						
Synthetic Fiber Manufacture						
Iron and Steel Manufacture						
Others (Specify)						
INDUSTRIAL SURFACE COATING						
Large Appliances						
Magnet Wire						
Automobiles						
Cans						
Metal Coils						
Paper						
Fabric						
Metal Wood Products						
Miscellaneous Metal Products						
Plastic Parts Painting						
Large Ships						
Large Aircraft						
Others (Specify)						

*Kilograms per day (kg/day) for a typical summer weekday

TABLE 1-a (continued)

	Base Year		Baseline Projection		SIP Strategy	
	1980		Attainment year		Attainment year	
	Point	Area	Point	Area	Point	Area
NON-INDUSTRIAL SURFACE COATING						
Architectural Coatings						
Auto Refinishing						
Others (Specify)						
OTHER SOLVENT USE						
Degreasing						
Dry Cleaning						
Graphic Arts						
Adhesives						
Cutback Asphalt						
Solvent Extraction Processes						
Consumer/Comercial Solvent Use						
Others (Specify)						
OTHER MISCELLANEOUS SOURCES						
Fuel Combustion						
Solid Waste Disposal						
Forest, Agricultural, and Other Open Burning						
Pesticide Application						
Waste Solvent Recovery Processes						
Stationary Internal Combustion Engines						
MOBILE SOURCES						
Highway Vehicles						
a) Light Duty Automobiles						
b) Light Duty Trucks						
c) Heavy Duty Gasoline Trucks						
d) Heavy Duty Diesel Trucks						
e) Motorcycles						
Off-Highway Vehicles						
Rail						
Aircraft						
Vessels						
Total						

[1] Includes all storage facilities except those at service stations and bulk plants.

[2] Emissions from loading tank trucks and rail cars.

[3] Emissions from storage and transfer operations.

TABLE 1-b

Summary Table for Oxides of Nitrogen Emissions*

for (geographical area)

	Base Year		Baseline Projection		SIP Strategy	
	1980		Attainment year		Attainment year	
	Point	Area	Point	Area	Point	Area
EXTERNAL FUEL COMBUSTION						
Utility Boilers						
Industrial Boilers						
Commercial, Institutional, Residential						
STATIONARY INTERNAL COMBUSTION						
Reciprocating Engines						
Gas Turbines						
INDUSTRIAL PROCESSES						
Chemical Manufacturing						
Adipic Acid						
Nitric Acid						
Other						
Iron and Steel						
Mineral Products						
Cement						
Glass						
Other						
Petroleum Refining						
Other						
INCINERATION AND OPEN BURNING						
MOBILE SOURCES						
Highway Vehicles						
Light Duty Automobiles						
Light Duty Trucks						
Heavy Duty Gasoline Trucks						
Heavy Duty Diesel Trucks						
Motorcycles						
Off-highway Vehicles						
Rail						
Aircraft						
Vessels						
Total						

*Kilograms per day (kg/day) for a typical summer weekday

reductions in emissions in the base year that may result from strikes, recession influenced production cutbacks or other unusual factors (such as a major equipment malfunction or variances) shall be considered to the extent feasible when projecting emissions to the attainment year. The projected base line attainment year inventory shall be submitted in summary format (see Table 1).

(b) The projected "1982 SIP strategy" attainment year inventory shall, in addition to the changes noted above, also consider the impact of additional regulatory controls to be adopted and submitted as part of the 1982 ozone SIP's. Implementation of 1979 SIP regulations is not considered an additional strategy for 1982 ozone SIP's. The "1982 SIP strategy" attainment year inventory shall also be submitted in summary format (i.e., Table 1).

(c) Procedures for projecting emissions are contained within Volume I.[3] Population estimates used to estimate and project emissions to future years shall be consistent with the population estimates provided for by the Agency's Cost Effectiveness Guidelines (40 CFR Part 35, Subpart E, Appendix A).[9] The same ambient conditions (e.g., temperature and humidity) affecting emissions in the base year shall be assumed to prevail in the projection year inventories.

4. Intermediate Year Inventories for Determining Reasonable Further Progress

In addition to the base year inventory and the two projected attainment year inventories, States shall compile a projection inventory for each intermediate year between the base year and the attainment year. The purpose of these intermediate year inventories (which can be less detailed than the base year inventory) is to demonstrate Reasonable Further Progress (RFP) in attaining the ozone standard. Each intermediate year inventory shall be prepared in a

format which must at least distinguish between emission reductions projected to result from mobile source and stationary source measures. These intermediate year summaries shall be submitted as part of the 1982 ozone SIP's and are not required as part of the inventory submittals. The RFP inventory shall demonstrate the impact of all increases and decreases in emissions due to growth and SIP controls.

5. Pollutants to be Inventoried

The inventory shall contain source information and emission estimates of oxides of nitrogen (NO_x) and reactive volatile organic compounds (RVOC). The Agency's position concerning reactive VOC's is discussed in the Federal Register (see 42 FR 35314 - July 8, 1977 and 45 FR 48941 - July 22, 1980).[10, 11] Nonreactive compounds that should be excluded from the inventory for purposes of ozone SIP's include:

methane
ethane
methylene chloride
methyl chloroform
trichlorotrifluoroethane (CFC-113)
trichlorofluoromethane (CFC-11)
dichlorodifluoromethane (CFC-12)
chlorodifluoromethane (CFC-22)
trifluoromethane (FC-23)
dichlorotetrafluoroethane (CFC-114)
chloropentafluoroethane (CFC-115)

Controls on emissions of these compounds will neither contribute to the attainment and maintenance of the national ambient air quality standard for ozone nor be credited toward achievement of that standard. Moreover, substitution of these compounds for reactive VOC is not a recommended control measure.

Emission factors for NO_x and VOC are contained within Compilation of Air Pollution Emission Factors, AP-42, including Supplements 1-10.[12] Emission factors have not yet been published in AP-42 for some source categories for which Control Technique Guideline Documents have been recently published. For these source categories, the use of emission factors published in the CTG's is appropriate. Information on the specific chemical compounds emitted from several major sources is contained in the Volatile Organic Compound (VOC) Species Data Manual (EPA-450/4-80-015, Second Edition, July 1980).[13]

6. Point Sources

At a minimum, stationary sources (facilities) that emit 250 kg/day or more of actual emissions of reactive VOC or NO_x shall be considered as point sources. More specifically, where the sum of emissions from all operations (including leaks, evaporative losses from storage tanks as well as process related emissions) at a source exceeds 250 kg/day, that source shall be considered a point source. (Note: For convenience, identical small points within those facilities may be grouped and reported collectively as a single point.) Point source emission cutoff levels smaller than 250 kg/day are strongly encouraged especially for sources affected by EPA's Control Technique Guideline Documents[1,2] and for those sources for which States will be defining RACT.

7. Non-Highway Area Sources

The purpose of the non-highway area source inventory is to encompass emissions from those stationary and non-highway sources that are too small and/or too numerous to be included in the point source inventory. As such, it is possible for area source emissions to be reported for many of the source categories listed in Table 1.

It is noted that emissions from many small sources have been inadvertently left out of some inventories in the past due to lack of available procedures or emphasis on this portion of the inventory. Various methodologies exist which can be used to estimate emissions from the various area source categories. Detailed procedures are discussed in Volume I,[3] however, some of these techniques are briefly described for emphasis.

(a) Use of Point Source Inventory Techniques (e.g., Questionnaires, Plant Visits)

Major sources are typically inventoried by use of questionnaires, plant visits, permit data, etc. It may also be necessary to obtain emission information for smaller sources (i.e, less than 250 kg/day) via the same methods since there may be no other alternatives available to accurately inventory smaller sources in certain source categories. For this reason, use of point source methods is recommended for determining emissions from certain source categories for sources below the 250 kg/day point source cutoff level. In such cases, the States may either maintain individual point source records for each of the smaller sources or emissions from such sources may be collectively totaled and reported in appropriate area source categories.

(b) Local Activity Level Surveys

In some instances, collective activity level estimates for a given category may be available from a local source. For example, local trade associations may have data on the amount and types of architectural surface coating, or the amount and types of dry cleaning solvents used in an area. Tax, highway, energy, and other State or local agency records may provide collective activity level estimates for other area source categories, including gasoline

sales or cutback asphalt use. Hence, the inventorying agency should survey various local associations and agencies to determine what information is maintained for the area that can be used in the area source inventory. Specific associations or agencies that may be contacted for selected area source activity level information are suggested in Volume I.[3]

(c) Per Capita Emission Factors

Emissions from certain area source categories, especially those associated with solvent use, may be estimated on a per capita basis. This procedure may be necessary when the availability of other area source estimating methodologies is limited. Population estimates used in making such emission estimates shall be consistent with the population projections required by EPA's Cost Effectiveness Guidelines.[9] To assure consistency from area to area, it is recommended that a per capita RVOC emission factor be used to estimate emissions from consumer/commercial solvent use. Specific information on per capita factors to be used and possible area-specific modifications to such per capita factors are contained in Volume I.[3]

(d) Emission-to-Employee Ratios

This procedure, which is discussed in Volume I,[3] essentially determines an "emission-per-employee" factor for those sources for which employment and emission data have been collected and extrapolates this information to estimate emissions from those facilities for which such information has not been collected. The procedure is best utilized for those source categories where (1) total employment in the source category is known for the area, and (2) where there are numerous sources whose emissions are typically less than 250 kg/day but whose collective emissions represent a significant total. The procedure should

not be used as a replacement of the requirement to obtain source specific data from each point source that emits more than 250 kg/day of reactive VOC or NO_x emissions.

8. Highway Vehicles

The highway vehicle emission inventory must account for all highway vehicles in the nonattainment area. Emissions from local traffic, as well as emissions from traffic on major highways, must be included. The transportation parameters used in the emission inventory must be the highest quality possible. Vehicle miles of travel (VMT) and vehicle speed are especially important. As previously noted, EPA will make city-specific recommendations to each of the 19 urban nonattainment areas for ozone for feasible actions to improve the quality of transportation data for 1982 ozone SIP's.

9. Seasonally Adjusted Emission Inventory

Reactive VOC and NO_x emissions shall be reported for a typical summer weekday; hence, daily emissions should be computed using assumptions which reflect conditions that exist during the summer months which primarily constitute the ozone season. This is accomplished in two ways.

First, for source categories whose operating rates vary seasonally, typical weekday emissions should be determined using activity levels representative of the ozone season. For example, highway vehicle traffic, gasoline handling, and space heating are examples of source categories whose activities generally vary from season to season. For some point sources, production (thruput) may increase or decrease during the summertime period. In compiling the emission inventory for 1982 ozone SIP's, summertime weekday activity rates shall be used

to compute a seasonally adjusted reactive VOC and NO_x emission inventory.

Secondly, certain emission factors for some source categories vary as a function of temperature and/or humidity. Most importantly, the emission factors for gasoline powered vehicles and petroleum product storage and handling operations are a function of temperature. Also, NO_x emissions from light-duty vehicles are a function of absolute humidity. In compiling the emission inventory for 1982 ozone SIP's, temperature and humidity assumptions shall be consistent with summertime conditions.

For consistency, it is recommended that all seasonally adjusted activity levels and ambient parameters used to calculate emissions represent daily (24 hour) averages during the June-August time period. Moreover, activity levels should represent weekday rather than weekend day averages for this time period. Reasonable deviations from this definition of a typical summer weekday are acceptable if agreed to by the Regional Office.

Generally, highway vehicle travel estimates are determined for an average annual weekday by the responsible Metropolitan Planning Organization or State Department of Transportation. All that is necessary to develop an inventory of emissions for a typical summer weekday is to apply a seasonal factor to adjust for increases (or decreases in some cases) in travel occurring during the ozone season. Generally, such an adjustment factor can be derived from local traffic counting programs.

Emission estimates for point and nonhighway area sources are frequently maintained for an annual period in State and local inventories. Hence, a seasonal adjustment may be needed as well as an adjustment to distinguish weekday from

weekend activity. For point sources, these adjustments should be based on the operating data which accompany the emissions data for each facility in the inventory. These operating data typically show the fraction of annual activity occurring during the summer (e.g., June-August) period as well as the number of days per week that the plant operates. If operating data are not available for each source, reasonable operating data should be assumed based on data available for similar sources in the inventory.

For nonhighway area sources, the inventorying agency will have to apply seasonal and weekday adjustments to annual area source activity levels based on local knowledge of the operating patterns of each source. If local operating data are unavailable to make such adjustments, the data presented in Appendix A may be utilizied for this purpose. Because local practices and ordinances may vary so much, the use of local data are strongly recommended.

10. Quality Assurance

A quality assurance program shall be implemented to assure that the emission inventory that is compiled is current, comprehensive and accurate. For example, this shall involve programs to insure that all major reactive VOC and NO_x sources are included in the inventory. To accomplish this, the States shall compare the plants listed in their inventories with independent listings prepared by EPA, trade associations, etc., or with listings derived by the States based on guidance contained in Volume I.[3]

III. SUBMISSION OF EMISSION INVENTORY DATA

The emission inventory effort shall be summarized and reported in the following formats:

1. Summary Format

(a) In order to facilitate strategy evaluation and assure area-to-area consistency, the reactive VOC emission inventory shall be summarized in the reporting format illustrated in Table 1. Individual tables shall be prepared which summarize seasonally adjusted emissions for:

(1) the entire nonattainment area; and

(2) each of the modeling analysis areas within the nonattainment area (in those cases where an entire State has been designed nonattainment).

(b) For each area identified above, individual summary tables shall be prepared in Table 1 format for:

(1) the base year inventory,

(2) the base line attainment inventory (i.e., generally 1987),

(3) the "1982 SIP strategy" attainment inventory (i.e., generally 1987),

Summary formats equivalent to those shown in Table 1 are acceptable if approved by the Regional Office and if the alternative formats still allow EPA to directly evaluate and compare the projected emission reductions resulting from the various RACT measures on a source category by source category basis.

2. VOC Point Source Listing

In order to facilitate strategy evaluation, information on all point sources whose reactive VOC emissions exceed 250 kg/day shall be reported in the format illustrated in Table 2. Any (including computer produced) formats containing equivalent information are acceptable if agreed to by the Regional Office. Such a listing is needed for only the base year inventory. Appendix B identifies major reactive VOC source categories and principal operations of interest that should be reported in Table 2.

3. Update into NEDS Format

The base year point source inventory data developed for the 1982 ozone SIP shall be generally consistent with and reflected in the routine National Emissions Data System (NEDS) update required no later than July 1982. NEDS reporting is described in AEROS Manual, Volume II.[14] For additional information on NEDS coding procedures, or to obtain coding manuals or instructions contact:

Requests & Information Section
National Air Data Branch (MD-14)
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711
Phone (919) 541-5395, (FTS 629-5395)

TABLE 2

Principal Emitting Operations at Point Sources of Reactive VOC Emissions* for (geographical area)

Name and Location _____

Major Reactive VOC Source Category _____

Principal Operations	Emissions*

*Kilograms per day (kg/day) for a typical summer weekday, in the base year

IV. DOCUMENTATION OF THE INVENTORY

A narrative report shall be prepared that documents the procedures, data and assumptions that were used in compiling the base year, base line attainment, and "SIP Strategy" inventories. Documentation of the base year and base line attainment inventories shall accompany the base year and base line attainment year inventory submittals due no later than December 31, 1981. Similarly, documentation for the SIP strategy inventory shall accompany the SIP strategy inventory due no later than July 31, 1982. For convenience, the SIP strategy inventory documentation may be combined with the base year and base line attainment year inventory documentation. Items to be included in the documentation are listed below:

(1) The geographic areas (i.e., the nonattainment area and modeling analysis areas) covered by the inventory shall be specified.

(2) The population of the area shall be provided as well as the source of the population data used in making emission estimates and projections.

(3) Data, assumptions and procedures used in determining or projecting emissions shall also be documented. Use and basis of emission factors other than those in AP-42 for stationary sources should be documented. Procedures and data used for exclusion of nonreactive VOC and for seasonally adjusting the inventory totals should likewise be documented. The point/area source cutoff level should be specified.

(4) The base year represented by the emission inventory should be specified. Similarly, the year of the attainment inventory shall be specified.

(5) For highway vehicles, the following information shall be reported:

(a) Description of procedures and models used to estimate base year and future year transportation parameters. (The parameters which EPA will review are identified in Table 3).

(b) Description of the travel data base and any subsequent updates. When possible, estimates of the degree of accuracy and other statistical parameters should be included.

(c) Description of traffic counting programs. Estimates of the degree of accuracy of VMT estimates based on traffic counts should be included.

(d) Description of methods used to estimate vehicle speeds. Special speed studies should be documented.

(e) Description of methods for estimating truck travel parameters (VMT, speed, etc.).

(f) Description of methods for estimating traffic parameters (VMT, speed, etc.) for local (off-network) traffic.

(g) Description of methods used to estimate vehicle hot and cold start and hot soak emissions.

(h) Description of methods used to calculate emissions, including a description of how data was aggregated and emission factors applied.

(i) Description of how other emission parameters (such as vehicle age distribution, average annual miles driven by model year) were obtained.

TABLE 3

Parameters for Documentation of Highway Vehicle Emission Inventories

Note: All parameters are areawide, i.e., for the entire modeling analysis area. See the EPA report Guidelines for Review of Highway Source Emission Inventories for 1982 SIP's.8

1. Population

2. Average daily vehicle miles of travel (VMT) by highway functional class*

   a. Interstate
   b. Principal Arterial
   c. Minor Arterial
   d. Collectors
   e. Local
   f. Total

3. Average daily VMT by vehicle class

   a. Light duty vehicles
   b. Light duty trucks less than 6000 lbs.
   c. Light duty trucks more than 6000 lbs.
   d. Heavy duty gas trucks
   e. Heavy duty diesel trucks
   f. Motorcycles
   g. Total

4. Average daily operating speeds (24 hours) by functional class*

   a. Interstate
   b. Principal Arterial
   c. Minor Arterial
   d. Collector
   e. Local
   f. Average daily speed for the system

5. Average daily trip length (minutes)

6. Average daily vehicle trips

   a. Passenger vehicles
   b. Trucks

7. Seasonal adjustment factor

8. Average daily cold start/hot start fractions

   a. Percent VMT in cold mode for catalyst vehicles
   b. Percent VMT in hot mode for catalyst vehicles
   c. Percent VMT in cold mode for non-catalyst vehicles

9. Meteorological data

   a. Ambient summertime temperature (°F)
   b. Ambient summertime humidity (grains/lb.)

10. Fraction of travel by model year by vehicle class

11. NMHC and NO_x vehicle emission rates (grams/VMT) by highway functional class (Interstate, Principal Arterials, etc.)

    a. Autos
    b. Trucks
    c. Total

12. NMHC and NO_x emissions (kilograms/summer weekday)

    a. By vehicle class
    b. By functional class
    c. Total for region

*These are suggested functional classes. Other classes may be used.

V. SUMMARY OF ITEMS TO BE SUBMITTED

1. A base year inventory of reactive VOC and NO_x emissions in summary table format (i.e., Table 1). Emissions shall be seasonally adjusted to represent typical summer weekday totals. The emissions summarized in Table 1 shall represent totals for (1) the entire nonattainment area and (2) for each modeling analysis area, in cases where only a portion(s) of the nonattainment area is being modeled. The base year inventory and documentation are due to be completed and submitted to the EPA Regional Office no later than December 31, 1981.

2. A listing of > 250 kg/day point sources of reactive VOC in the nonattainment area, reported by major category and principal operation (see Table 2). This listing shall be for the base year only and should be included in the base year inventory submittal.

3. A base line attainment year inventory of reactive VOC and NO_x emissions in summary table format (i.e., Table 1). Emissions shall be seasonally adjusted to represent typical summer weekday totals. The emissions summarized in Table 1 shall represent totals for (1) the entire nonattainment area and (2) for each modeling analysis area. The base line attainment year inventory and documentation are due to be completed and submitted to the EPA Regional Office no later than December 31, 1981.

4. A "1982 SIP Strategy" attainment year inventory of reactive VOC and NO_x in summary table format (i.e., Table 1). Emissions shall be seasonally adjusted to represent typical summer weekday totals. The emissions summarized in Table 1 shall represent totals for (1) the entire attainment year inventory and (2) for each modeling analysis area. The SIP strategy attainment year inventory and documentation are due to be completed and submitted to the EPA Regional Office no later than July 31, 1982.

5. A report that documents the procedures, data and assumptions used in compiling the emission inventories. Documentation for the base year, base line attainment, and SIP strategy inventories shall accompany the respective inventory submittals.

6. The reactive VOC and NO_x point source data developed for the 1982 ozone SIP's shall be consistent with and reflected in the data to be submitted to EPA for update into NEDS according to existing routine reporting requirements.

VI. REFERENCES AND OTHER GUIDANCE

1. Summary of Group I Control Techniques Guidelines Documents for Control of Volatile Organic Emissions from Existing Stationary Sources EPA-450/3-78-120, December 1978.

2. Summary of Group II Control Techniques Guidelines Documents for Control of Volatile Organic Emissions from Existing Stationary Sources EPA-450/2-80-001, December 1979.

3. Procedures for the Preparation of Emission Inventories for Volatile Organic Compounds, Volume I, Second Edition, EPA-450/2-77-028, September 1980.

4. Transportation-Air Quality Planning Guidelines, EPA-DOT, June 1978.

5. Users Guide to MOBILE1: Mobile Source Emissions Model, EPA-400/9-80-007, U.S. Environmental Protection Agency, Washington, DC., August 1978.

6. Users Guide to MOBILE2: Mobile Source Emissions Model, U.S. Environmental Protection Agency, (In printing.)

7. Data Collection for 1982 Ozone Implementation Plan Submittals, 44 FR, 65667, November 14, 1979.

8. Guidelines for Review of Highway Source Emission Inventories for 1982 SIP's, Office of Transportation and Land Use Policy, Environmental Protection Agency. December 1980.

9. EPA Cost Effectiveness Guidelines, 40 CFR Part 35, Subpart E, Appendix A.

10. Recommended Policy on Control of Volatile Organic Compounds, 44 FR 35314, July 8, 1977.

11. Clarification of Agency Policy Concerning Ozone SIP Revisions and Solvent Reactivities, 45 FR 48941, July 22, 1980.

12. Compilation of Air Pollutant Emission Factors, Third Edition and Subsequent Supplements (Supplements 8-10), AP-42, Environmental Protection Agency, August 1977.

13. Volatile Organic Compound (VOC) Species Data Manual, EPA-450/4-80-015. Second Edition, July 1980.

14. AEROS Manual Series, Volume II. AEROS User's Manual, EPA-450/2-76-029-2.

APPENDIX A

DEFAULT SEASONAL AND WEEKDAY ADJUSTMENTS FOR AREA SOURCES

AREA SOURCE CATEGORY	SEASONAL ADJUSTMENT	WEEKDAY ADJUSTMENT
EVAPORATIVE LOSS		
Gasoline Handling	Uniform seasonal distribution	Uniform Monday-Saturday
Degreasing	"	"
Drycleaning	"	"
Architectural Surface Coating	75 percent of annual total uniform spring-fall	Uniform throughout the week
Automobile Refinishing	"	Uniform Monday-Saturday
Other Small Industrial	"	"
Graphic Arts	"	"
Commercial/Consumer Solvent	"	Uniform throughout the week
Cutback Asphalt	Uniform spring through fall	Uniform throughout the week
Pesticides	Uniform during growing season, with exception of dormant season oils	Uniform throughout the week
COMBUSTION		
Residential Fuel	7 percent of annual total uniform over June-August quarter	Uniform throughout the week
Commercial/Institutional Fuel	15 percent of annual total uniform over June-August quarter	Uniform Monday-Saturday
Industrial Fuel	Uniform seasonal distribution	"
Aircraft	"	Uniform throughout the week
Railroad Locomotives	"	"
Vessels	"	"
Off-highway Vehicles	"	Uniform Monday-Saturday
Incineration	"	"
Open Burning/Fires	Dependent on local ordinances and practices	Dependent of local ordinances and practices

APPENDIX B

INDIVIDUAL POINT SOURCE SUMMARY

STORAGE, TRANSPORTATION AND MARKETING OF VOC

- Oil and Gas Production and Processing
  - Storage
  - Fugitives
  - Other Process Units (Specify)
- Tank Farms
  - Fixed Roof Tanks
  - External Floating Roof Tanks
    - Primary Seals
    - Secondary Seals
  - Internal Floating Roof Tanks
- Bulk Gasoline and VOC Terminals
  - Leaks from Valves, Flanges Meters, Pumps
  - Vapor Collection Losses
  - Vapor Control Unit Losses
  - Filling Losses from Uncontrolled Loading Racks
  - Tank Truck Vapor Leaks from Loading of Gasoline
  - Non-Tank Farm Storage
- Gasoline Bulk Plants
  - Gasoline Bulk Storage
  - Loading and Unloading Racks (Controlled and Uncontrolled)
  - Tank Truck Vapor Leaks from Loading and Unloading of Gasoline
  - Leaks from Valves, Flanges, Meters, Pumps
- Barge and Tanker Transfer
  - Gasoline Loading/Barge
  - Crude Oil Ballasting/Tanker
- Barge and Tanker Cleaning

INDUSTRIAL PROCESSES

- Petroleum Refineries
  - Process Drains and Wastewater Separators
  - Vacuum Producing Systems
  - Process Unit Turnarounds
  - Fugitive Leaks from Seals, Valves, Flanges
    - Pressure Relief Devices, Drains
  - Other Process Emissions Such as Heaters, Boilers,
    - Cat Cracker Regenerators (Specify)
- Lube Oil Manufacture

Pharmaceutical Manufacture
- Process Units Such as Vacuum Dryers, Reactors, Distillation Units, Filters, Extractors, Centrifuges, Crystallizers
- Major Production Equipment Such as Exhaust Systems and Air Dryers
- Storage and Transfer
- Other Process Units (Specify)

Rubber Tire Manufacture
- Undertread and Sidewall Cementing
- Bead Dipping
- Bead Swabbing
- Tire Building
- Tread End Cementing
- Green Tire Spraying
- Tire Curing
- Solvent Mixing
- Solvent Storage
- Other Process Units (Specify)

Styrene Butadiene Rubber Manufacture
- Blowdown Tanks
- Steam Stripper
- Prestorage Tanks
- Other Process Units (Specify)

Vegetable Oil
- Oil Extraction and Desolventization
- Meal Preparation
- Oil Refining
- Fugitive Leaks
- Solvent Storage
- Other Process Units (Specify)

Organic Chemical Manufacture
- Fugitive Leaks from Seals, Valves, Flanges, Pressure Relief Devices, Drains
- Air Oxidation Units
- Waste Water Separators
- Storage and Transfer
- Other Process Units (Specify)

Polymer and Resin Manufacture
- Catalyst Preparation
- Reactor Vents
- Separation of Reactants, Solvents and Diluents from Product
- Raw Material Storage
- Solvent Storage
- Other Process Units (Specify)

Plastic Parts Manufacture
- Mold Release
- Solvent Consumption
- Adhesives Consumption
- Other Process Units (Specify)

Inorganic Chemical Manufacture
- Fugitive Leaks from Seals, Valves, Flanges, Pressure Relief Devices, Drains
- Storage and Transfer
- Other Process Units (Specify)

Fermentation Processes
- Fermentation Tank Venting
- Aging/Wine or Whisky
- Other Process Units (Specify)

Iron and Steel Manufacture
- Coke Production
  - Coke Pushing
  - Coke Oven Doors
  - Coke Byproduct Plant
  - Coke Charging
  - Coal Preheater
  - Topside Leaks
  - Quenching
  - Battery Stacks
- Sintering
- Electric Arc Furnaces
- Other Process Units (Specify)

Synthetic Fiber Manufacture
- Dope Preparation
- Filtration
- Fiber Extrusion - Solvent Recovery
- Takeup Stretching, Washing, Drying, Crimping, Finishing
- Fiber Storage - Residual Solvent Evaporation
- Equipment Cleanup
- Solvent Storage
- Other Process Units (Specify)

INDUSTRIAL SURFACE COATING

Large Appliances
- Cleaning and Pretreatment
- Prime Spray, Flow, or Dip Coating Operations
- Topcoat Spray
- Coating Mixing
- Coating and Solvent Storage
- Equipment Cleanup
- Other Process Emissions (Specify)

Magnet Wire
- Cleaning and Pretreatment
- Coating Application and Curing
- Coating Mixing
- Coating and Solvent Storage
- Equipment Cleanup
- Other Process Emissions (Specify)

Automobiles and Light Duty Trucks
- Cleaning and Pretreatment
- Prime Application, Electro deposition, Dip or Spray
- Prime Surfacting Operations
- Topcoat Operation
- Repair Topcoat Application Area
- Coating Mixing
- Coating and Solvent Storage
- Equipment Cleanup
- Other Process Emissions (Specify)

Cans
- Cleaning and Pretreatment
- Two Piece and Exterior Base Coating
- Interior Spray Coating
- Sheet Basecoating (Interior)
- Sheet Basecoating (Exterior)
- Side Seam Spray Coating
- End Sealing Compound
- Lithography
- Over Varnish
- Coating Mixing
- Coating and Solvent Storage
- Equipment Cleanup
- Other Process Emissions (Specify)

Paper
- Coating Operations
- Coating Mixing
- Coating and Solvent Storage
- Equipment Cleanup
- Other Process Emission (Specify)

Coil Coating
- Prime Coating
- Finish Coating
- Solvent Mixing
- Solvent Storage
- Equipment Cleanup
- Other Process Emissions (Specify)

Fabric
- Coating Operations
- Coating Mixing
- Coating and Solvent Storage
- Equipment Cleanup
- Other Process Emissions (Specify)

Wood Furniture
- Coating Operations
- Coating Mixing
- Coating and Solvent Storage
- Other Process Emissions (Specify)

Metal Furniture
- Cleaning and Pretreatment
- Coating Operations
- Coating Mixing
- Coating and Solvent Mixing
- Equipment Cleanup
- Other Process Emissions (Specify)

Flatwood Products
- Filler
- Sealer
- Basecoat
- Topcoat
- Inks
- Coating Mixing
- Coating and Solvent Storage
- Equipment Cleanup
- Other Process Emissions (Specify)

Plastic Parts Painting
- Cleaning and Pretreatment
- Coating Operations, Flow, Dip, Spray
- Coating Mixing
- Coating and Solvent Storage
- Equipment Cleanup
- Other Process Emissions (Specify)

Large Ships
- Cleaning and Pretreatment
- Prime Coat Operation
- Topcoat Operation
- Coating Mixing
- Coating and Solvent Storage
- Equipment Cleanup
- Other Process Emissions (Specify)

- Large Aircraft
  - Cleaning and Pretreatment
  - Prime Coat Operation
  - Topcoat Operating
  - Coating and Solvent Storage
  - Equipment Cleanup
  - Other Process Emissions (Specify)
- Miscellaneous Metal Parts and Products
  - Cleaning and Pretreatment
  - Coating Operations, Flow, Dip, Spray
  - Coating Mixing
  - Coating and Solvent Storage
  - Equipment Cleanup
  - Other Process Emissions (Specify)

OTHER SOLVENT USE

- Dry Cleaning
- Degreasing
  - Open Top Vapor Degreasing
  - Conveyorized Degreasing - Vapor
  - Conveyorized Degreasing - Cold Cleaning
- Solvent Extraction Processes
- Adhesives
  - Adhesive Application
  - Solvent Mixing
  - Solvent Storage
  - Other Process Emissions (Specify)
- Graphic Arts
  - Letter Press
  - Rotogravure
  - Offset Lithography
  - Ink Mixing
  - Solvent Storage

OTHER SOURCES

- Waste Solvent Recovery Processes